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I, KIM MARSHALL, MANAGER EXAMINATION SUPPORT AND SALES,
hereby certify that the annexed is a true copy of the Provisional specification in
connection with Application No. PO 8523 for a patent by ANTHONY JOHN
GARDNER filed on 12 August 1997.

I further certify that the annexed specification is not, as yet, open to public inspection.



WITNESS my hand this Twentieth
day of August 1998

KIM MARSHALL
MANAGER EXAMINATION SUPPORT AND
SALES

AUSTRALIA
Patents Act 1990

PROVISIONAL SPECIFICATION

FOR THE INVENTION ENTITLED:

"STEREOSCOPIC VIEWING SYSTEM"

Applicant:

ANTHONY JOHN GARDNER

The invention is described in the following statement:

STEREOSCOPIC VIEWING SYSTEM

The present invention relates to a stereoscopic viewing system and, more particularly, to such a system adapted for viewing a stereoscopic image without the aid of spectacles or similar image separating device located close to the eyes of a viewer.

BACKGROUND

Forms of stereoscopic television/video systems which provide stereoscopic viewing without the use of glasses or other encumbrances placed close to the eyes of a viewer are known. Once such system is the so-called lenticular system wherein the image for viewing is made up of interleaved vertical image strips from two (left image and right image) camera views. In order to allow the eyes to resolve the two images into a single stereoscopic image, lenses in the form of vertically arranged contiguous cylindric lenses overlay the vertical image strips whereby, by refraction, the left image is directed towards the left eye of a viewer and the right image is directed towards the right eye of a viewer when the eyes are placed in a predetermined focal plane, or very near thereto. U.S. Patent No. 5,258,833 to Schenk describes this general background with reference to U.S. Patent No. 4,214,257 (Yamauchi) and U.S. Patent No. 2,543,793 (Marks). The systems described in those patents suffer from a sensitivity in the location of the focal plane for viewing.

It is an object of the present invention to ameliorate the above-mentioned problem and/or at least provide a useful alternative.

BRIEF DESCRIPTION OF INVENTION

Accordingly, in one broad form of the invention, there is provided a stereoscopic viewing system comprising a raw image overlaid by a mask arranged so that a viewer can resolve a stereoscopic image derived from said raw image in a focal plane of predetermined width located a predetermined distance from said mask.

Preferably said raw image is comprised of alternating left image strips and right image strips on both of pitch P.

Preferably said mask includes vertical lenticular lens strips corresponding to said left and right image strips and arranged to refract light received therefrom so as to cause a stereoscopic image to be resolved by said viewer in said focal plane.

Preferably said mask further includes opaque vertical strips interposed in
5 between said lenticular lens strips.

Preferably said opaque strips are of pitch P and overlay half the width of adjacent left and right image strips.

BRIEF DESCRIPTION OF DRAWINGS

Embodiments of the invention will now be described with reference to the
10 accompanying drawings wherein:-

Figure 1 illustrates the general layout of a stereoscopic viewing system to which embodiments of the present invention can be applied;

Figure 2 illustrates steps in the formation of a raw stereoscopic image according to a first embodiment of the invention;

15 Figure 3 illustrates a mask applicable to the raw image of Figure 2; and

Figure 4 illustrates a mask applicable to a colour version of the embodiment of Figure 2.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

With reference to Figure 1, there is shown a stereoscopic viewing system 10
20 comprising a raw image 11 and a mask 12. The mask 12 includes an optical arrangement whereby light rays from the raw image 11 are directed to either the left eye 13 or right eye 14 of a viewer 15 so as to form a three-dimensional image to the viewer.

With reference to Figures 2A and 2B, the raw image 11 is formed as
25 follows:-

A stereoscopic image is generated initially as two separate images comprising a left eye view and a right eye view. The left eye view is labelled image A whilst the right eye view is labelled image B. Each image is then divided up into vertical strips of pitch P. Figure 2A represents the left image thus partitioned. Figure 2B
30 represents the right eye image thus partitioned. Consecutive strips are then

interchanged between the two images as indicated by the arrows thereby to produce a raw image 11 which combines both the left and right images in it.

The raw image may be in the form of a photograph or it may be in the form of a video display. In either case, light reflected from or light emanating the raw image needs to be optically processed through a mask 12 so as to redirect the light rays for reconstruction by eyes 13, 14.

In the case of a black and white image, the mask is formed as indicated in Figure 3.

The black and white raw image 11 of Figure 3A comprising alternating vertical strips of left image A and right image B is overlaid by the mask generally illustrated in Figure 3B. The mask comprises vertical lens strips 16 of pitch P arranged to overlay a half-width of a left image strip and a half-width of a right image strip. The lens strips 16 are of the lenticular type and can be constructed in the manner described in U.S. Patent No. 5,258,833.

Interposed between the lens strips 16 are opaque strips 17, also of pitch P and also arranged so as to overlay a half-width of adjacent left image strips and right image strips A, B as generally illustrated in Figure 3B.

With reference to Figure 4, the manner of construction of a colour raw image 18 is illustrated in Figure 4A and comprises alternating left image colour strips 19 and right image colour strips 20. Each image strip is, itself, comprised of three primary colour strips labelled R (red) G (green) and B (blue). The corresponding colour mask 21 is illustrated in Figure 4B and comprises left vertical lens strips 22 and alternating right vertical lens strips 23, each constructed according to the lenticular methods previously known. In addition, an opaque strip 24 is placed, as illustrated in Figure 4B immediately between adjacent vertical lens strips 22, 23 and, correspondingly, 23, 22. The pitch of the opaque strip 24 is such as to cover a primary colour strip, a different colour strip in each consecutive occurrence.

In this manner, it will be noted that the opaque strips remove some redundant image information according to a predetermined algorithm. The effect is to widen the width W of the focal plane 25 of viewer 15 in which a stereoscopic image can be resolved.

The above describes only one embodiment of the present invention and modifications, obvious to those skilled in the art, can be made thereto without departing from the scope and spirit of the present invention.

The claims defining the invention are as follows:

1. A stereoscopic viewing system comprising a raw image overlaid by a mask arranged so that a viewer can resolve a stereoscopic image derived from said raw image in a focal plane of predetermined width located a predetermined distance from said mask.
2. The system of claim 1 wherein said raw image is comprised of alternating left image strips and right image strips on both of pitch P.
3. The system of claim 2 wherein said mask includes vertical lenticular lens strips corresponding to said left and right image strips and arranged to refract light received therefrom so as to cause a stereoscopic image to be resolved by said viewer in said focal plane.
4. The system of claim 3 wherein said mask further includes opaque vertical strips interposed in between said lenticular lens strips.
5. The system of claim 4 wherein said opaque strips are of pitch P and overlay half the width of adjacent left and right image strips.

DATED: 12 August 1997

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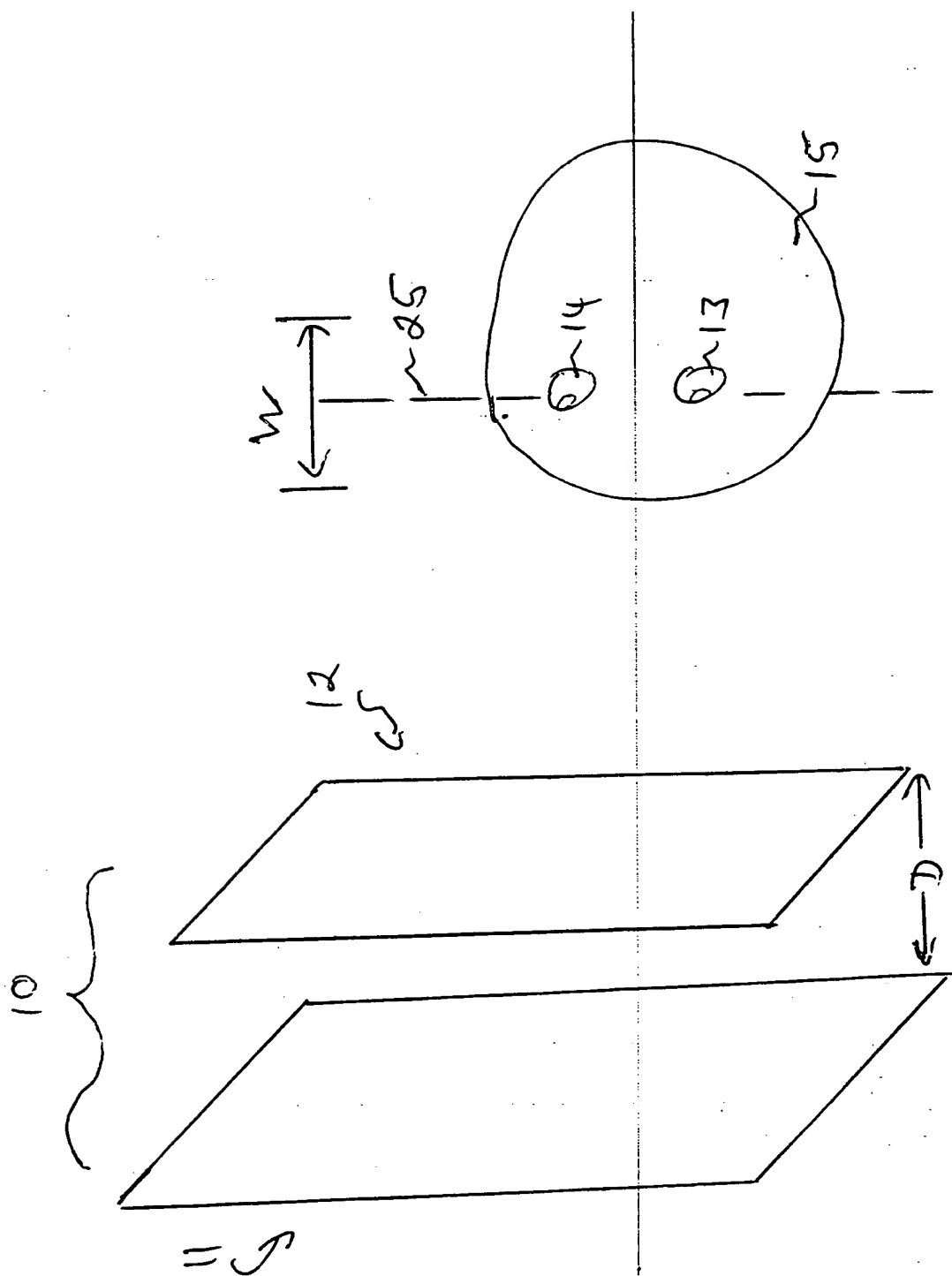
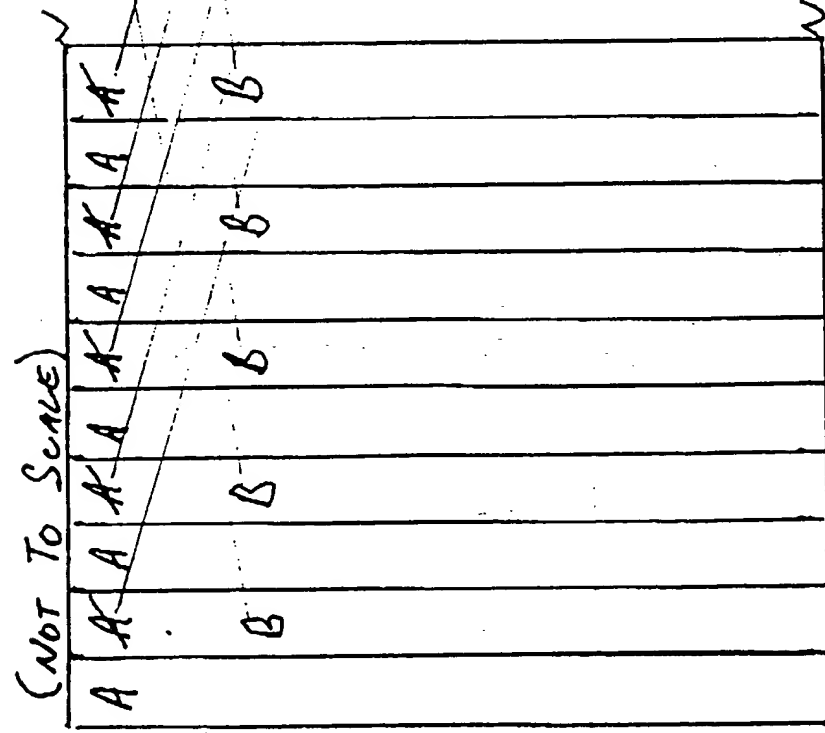


Fig 1

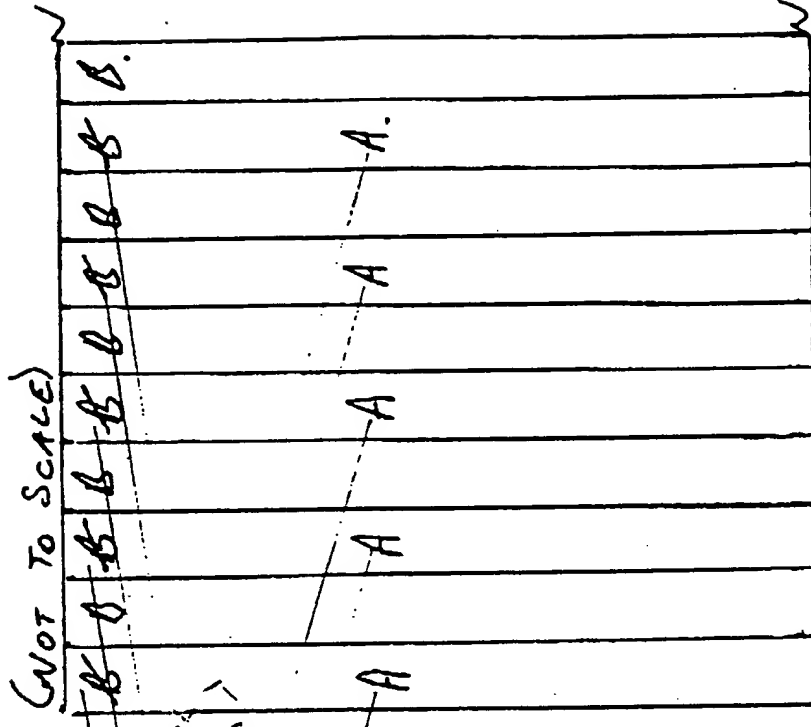
FIGS 2A & 2B FORM FIG. 1. A & B. EVERY OTHER "A" ARE
TAKEN OUT, (AS SHOWN) AND REPLACED WITH AN "OPPOSITE" COLUMN.



→ P.

FIG. 2-A

IMAGE "ONE" OR "LEFT" IMAGE
MADE UP IN COLUMNS AT ANY
GIVEN PITCH. ("A" OR "LEFT" COLUMNS)



→ P.

FIG. 2-B

IMAGE "TWO" OR "RIGHT" IMAGE
("B" COLUMNS OR "RIGHT" COLUMNS)

FIG 2

Fig 3A & 3B. Fig 3A. REPRESENTS CUMULATION IN ALL SAID WAYS & FIG 3B. REPRESENTS I.A.C.M & CAN BE SET TO ANY BITCH OR WIDTM. (NOT TO SCALE)

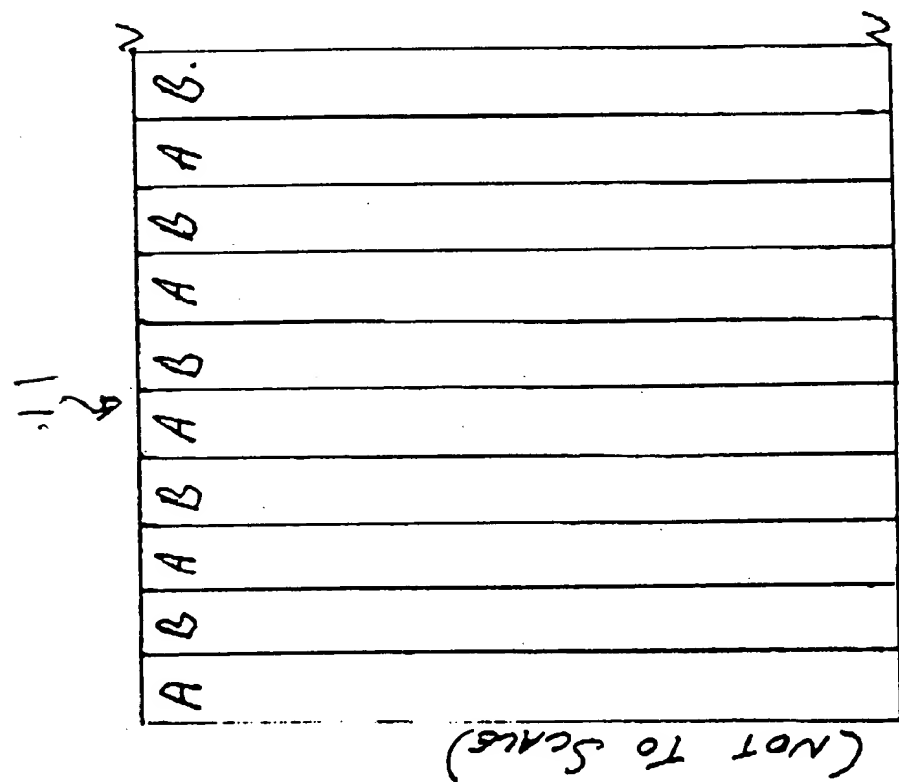


Fig 3A - CUMULATED

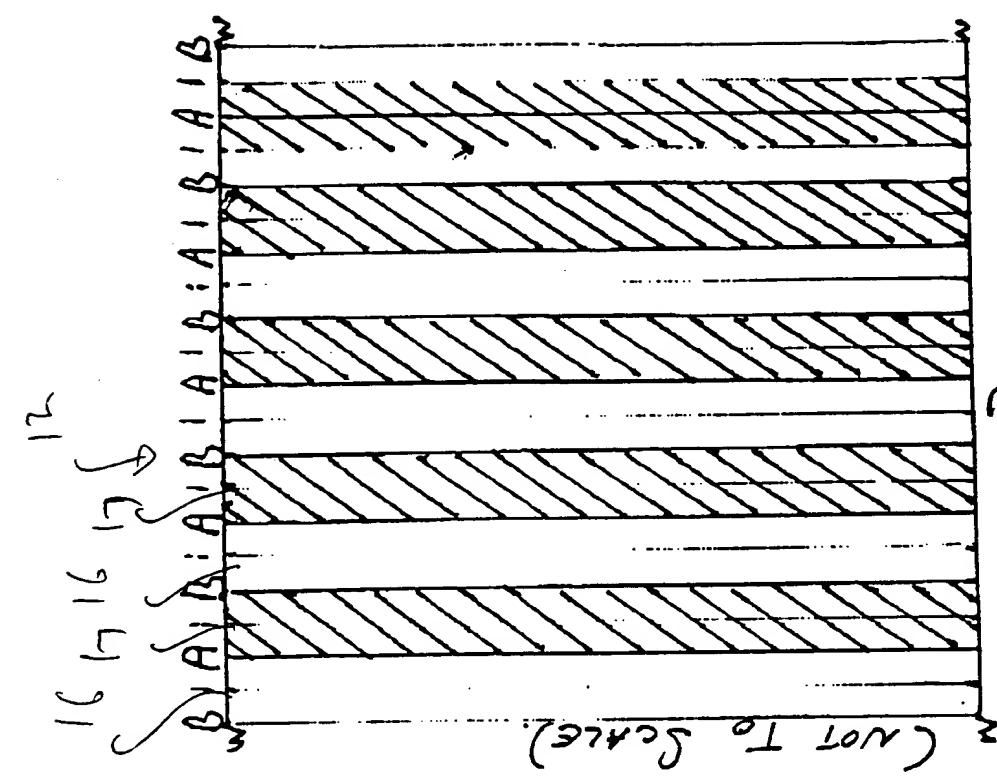


Fig 3B - CUMULATED WITH "MASK"

Fig 4A & 4B. Fig 4A REPRESENTS A "PIXEL SIZE" COMPRISING OF "RED", "GREEN" & "BLUE". TAKING OUT THE FIRST COLUMN OF THE NEXT PIXEL TO PUT IN IT'S PLACE THE "I.A.C.M." TO FORM FIG 3B. ~
New Pixel Size.

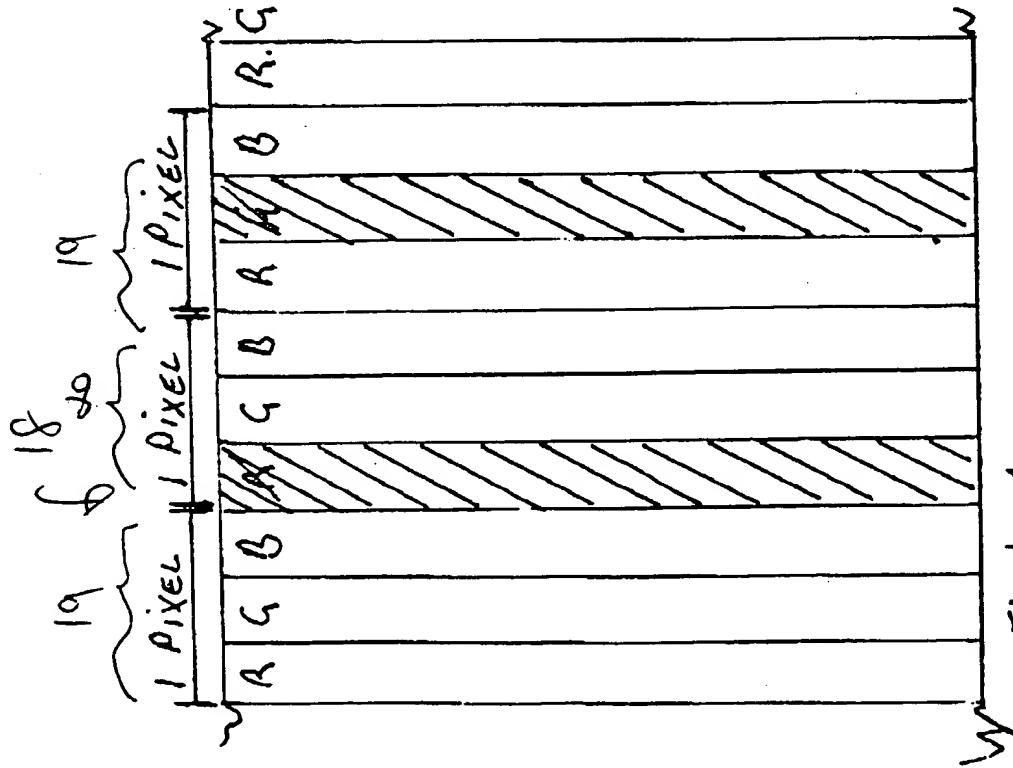


Fig 4 A.

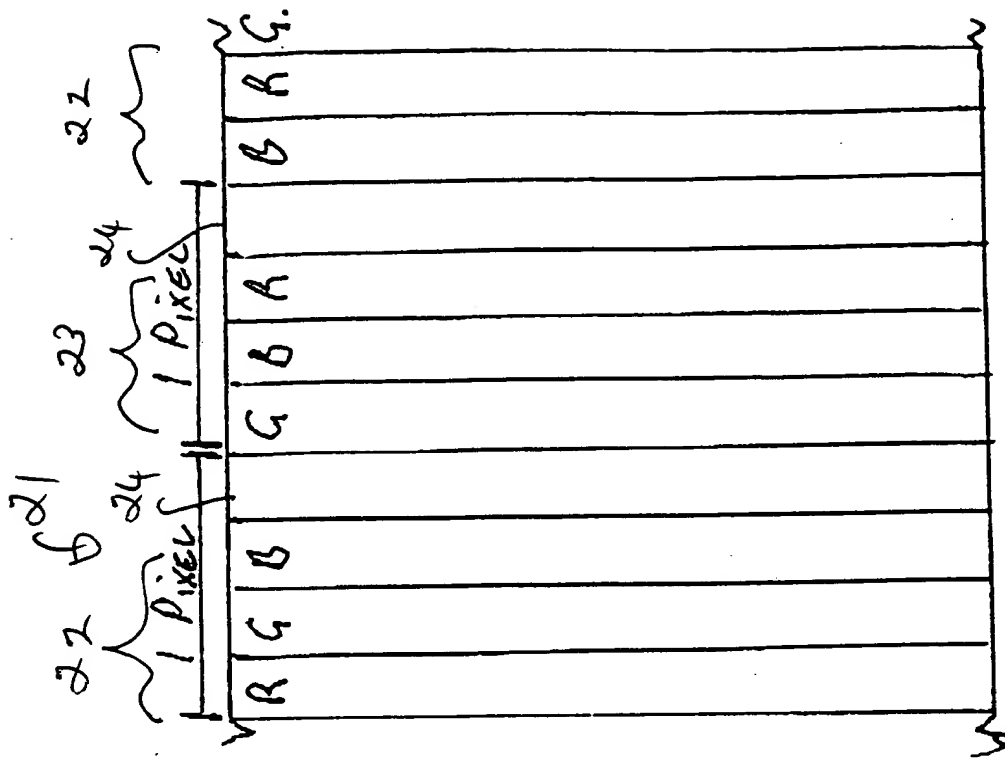


Fig 4 B.

Fig 4

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